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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/780,850	02/19/2004	Lucas Lemar Clarke	839-1542	2475
30024	7590	03/08/2006	EXAMINER	
NIXON & VANDERHYE P.C. 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			MALEVIC, DJURA	
			ART UNIT	PAPER NUMBER
			2884	

DATE MAILED: 03/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/780,850

Applicant(s)

CLARKE ET AL.

Examiner

Djura Malevic

Art Unit

2884

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 2/19/24 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/24/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Information Disclosure Statement

The information disclosure statement (IDS) filed on 5/24/04 was considered by the examiner.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 4 – 16 and 18 – 25 rejected under 35 U.S.C. 103(a) as being unpatentable over Frederick (US Patent 6355932) in view of Frederick *et al.* (US Pub 20020030400) or Hefetz *et al.* (US Patent 6,369,391).

With regards to claim 1, Frederick ('932) discloses a radiation detector 10 (Figure 1) comprising a housing 16, a scintillating crystal 14, a photomultiplier tube 38 and a plurality of elongated rails 22 extending along scintillating crystal 14 and housing 16, thus creating an air gap between said crystal and said housing. Frederick ('932) further discloses that all elements of the detector assembly are either cylindrical or rectangular (Col. 10, Line 46), thus including a rectangular crystal having four longitudinally extending corners. Frederick ('932) does not expressly disclose a light pipe located axially between PMT and the scintillating crystal. However, light pipes are known to be excellent couplers from the scintillator to the PMT. References such as Frederick (US Pub. 20020030400 A1) teach a light pipe 135 that optically couples the scintillation element 110 to the photomultiplier tube (PMT) 114 (Figure 16). Also, a reference

Art Unit: 2884

such as Hefetz (US Patent 639391 B1) teaches a scintillator which includes a shaped light guide (pipe) to guide the light from scintillator to the sensor (PMT) (Col. 4, Line 49++).

Thus, it would have been obvious at the time the invention was made to a person of ordinary skill in the art to include in Frederick a light pipe in order to give excellent optical paths between the scintillator and the PMT such as that taught by Frederick and Hefetz.

With regards to claim 4, Frederick discloses that the rails extend about 90% of the length of the crystal (Figure 1).

With regards to claim 5, Frederick discloses that the rails are compressed in a direction perpendicular to the longitudinal axis of said crystal (Figure 1) (Col. 9, Line 40).

With regards to claims 6 and 7, Frederick discloses that the whole detector assembly is rectangular, thus including the housing and Frederick also discloses a spring between said crystal and housing (Col. 10, Line 46).

With regards to claim 8, Frederick discloses that the whole detector assembly is rectangular, thus including a photomultiplier that is substantially square in cross section (Col. 10, Line 46).

With regards to claims 9, Frederick discloses that the whole detector assembly is rectangular, thus including a light pipe that has a substantially square face interfacing with said photomultiplier and a rectangular face interfacing with said crystal (Col. 10, Line 46).

With regards to claim 10, Frederick discloses the radiation detector as claimed in claim 9, but does not expressly disclose the light pipe comprising said substantially square face having a greater surface area than said rectangular face. It would have been an obvious matter of design choice to have a light pipe with different surface areas for engagement with the PMT and scintillating crystal, since such a modification

Art Unit: 2884

would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

With regards to claim 11, Frederick discloses compression plates on opposite axial sides of the spring (Col. 8, Line 12).

With regards to claim 12, Frederick discloses the spring comprising a pair of annular wave springs (Col. 9, Line 15).

With regards to claim 13, Frederick discloses that the whole detector assembly is rectangular, thus including a crystal substantially rectangular in cross section (Col. 10, Line 46).

With regards to claim 14, Frederick discloses that the photomultiplier tube cover encloses said photomultiplier tube and is joined at one end of the said housing at respective flange portions (Figure 1).

With regards to claim 15, Frederick discloses that an electronic assembly at the end of the PMT with annular wave springs between flange 58 and PMT 38 (Col. 10, Line 43; Col 9, Line 10 – 20).

With regards to claim 16, Frederick discloses a radiation detector 10 (Figure 1) comprising a housing 16, a scintillating crystal 14, a photomultiplier tube 38 and a plurality of elongated rails 22 extending along scintillating crystal 14 and housing 16. Frederick further discloses that all elements of the detector assembly are either cylindrical or rectangular (Col. 10, Line 46), thus including a rectangular crystal having four longitudinally extending corners. Frederick does not expressly disclose a light pipe located axially between PMT and the scintillating crystal. Frederick also does not expressly disclose a plurality of brackets extending along scintillating crystal and a light pipe having a substantially square face interfacing with said PMT tube and a substantially rectangular face interfacing with said crystal. However, light pipes are known to be excellent couplers from the scintillator to the PMT. References such as Frederick (US Pub. 20020030400 A1) teaches a light pipe 135 that optically couples the scintillation

Art Unit: 2884

element 110 to the photomultiplier tube (PMT) 114 (Figure 16). Also, a reference such as Hefetz (US Patent 639391 B1) teaches a scintillator which includes a shaped light guide (pipe) to guide the light from scintillator to the sensor (PMT) (Col. 4, Line 49++).

Thus, it would have been obvious at the time the invention was made to a person of ordinary skill in the art to include in Frederick a light pipe in order to give excellent optical paths between the scintillator and the PMT such as that taught by Frederick and Hefetz.

It also would have been obvious at the time the invention was made to a person of ordinary skill in the art to include in Frederick a bracket consisting of springs intended for a rectangular crystal to absorb vibration and shock.

It further would have been an obvious matter of design choice to have a light pipe with different surface areas for engagement with the PMT and scintillating crystal, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

With regards to claim 18, Frederick discloses that the radial springs are coated with polytetrafluorethylene (TEFLON) (Col 9, Line 63), thus disclosing rails comprising a low-friction plastic material.

With regards to claim 19, Frederick discloses compression plates on opposite axial sides of the spring (Col. 8, Line 12).

With regards to claim 20, Frederick discloses that the whole detector assembly maybe cylindrical, annular or rectangular thus, including a square PMT and a housing substantially round in cross section.

With regards to claim 21, Frederick discloses that an electronic assembly at the end of the PMT with annular wave springs between flange 58 and PMT 38 (Col. 10, Line 43; Col 9, Line 10 – 20).

With regards to claim 22, Frederick discloses that the rails extend about 90% of the length of the crystal (Figure 1).

With regards to claim 23, Frederick discloses that the rails are compressed in a direction perpendicular to the longitudinal axis of said crystal (Figure 1) (Col. 9, Line 40).

With regards to claim 24, Frederick discloses the radiation detector as claimed in claim 9, but does not expressly disclose the light pipe comprising said substantially square face having a greater surface area than said rectangular face. It would have been an obvious matter of design choice to have a light pipe with different surface areas for engagement with the PMT and scintillating crystal, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

With regards to claim 25, Frederick discloses that the whole detector assembly is rectangular (Col. 10, Line 46), thus including the housing and Frederick also discloses a spring between said crystal and housing.

Claims 2, 3 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frederick (US Patent 6,355,932) in view of Frederick *et al.* (5,962,855), and in further view of Frederick *et al.* (US Pub 20020030400) or Hefetz (US Patent 639391 B1).

With regards to claim 2, Frederick discloses the radiation detector as claimed in claim 1 but does not expressly disclose the rails lined on interior surfaces with foam shock absorbing material. Frederick (US Patent 5962855) teaches springs (rails) 408 and an elastomeric foam 410 providing support and cushioning for the scintillating element 14 (Col. 7, Line 18++). Thus, it would have been obvious at the time the invention was made to a person of ordinary skill in the art to include in Frederick an elastomeric foam such

as that taught by Frederick (US Patent 5962855) in order to give added protection for absorbing shock and/or vibration for the scintillating crystal.

With regards to claim 3, Frederick discloses that the radial springs are coated with polytetrafluorethylene (TEFLON) (Col 9, Line 63), thus disclosing rails comprising a low-friction plastic material.

With regards to claim 17, Frederick discloses the radiation detector as claimed in claim 1 but does not expressly disclose the rails lined on interior surfaces with foam shock absorbing material. Frederick (US Patent 5962855) teaches a springs (rails) 408 and an elastomeric pad and/or foam 410 providing support and cushioning for the scintillating element 14 (Col. 7, Line 18++). Thus, it would have been obvious at the time the invention was made to a person of ordinary skill in the art to include in Frederick an elastomeric foam such as that taught by Frederick (US Patent 5962855) in order to give added protection for absorbing shock and/or vibration for the scintillating crystal.

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Frederick (US Patent 6,355,932) in view of Frederick *et al.* (5,962,855), Frederick *et al.* (US Pub 20020030400) or Hefetz (US Patent 639391 B1).

With regards to claim 26, Frederick discloses a radiation detector 10 (Figure 1) comprising a housing 16, a scintillating crystal 14, a photomultiplier tube 38 and a plurality of elongated rails 22 extending along scintillating crystal 14 and housing 16, thus creating an air gap between said crystal and said housing. Frederick further discloses that all elements of the detector assembly are either cylindrical or rectangular (Col. 10, Line 46), thus including a rectangular crystal having four longitudinally extending corners and springs between said crystal and housing. Frederick does not expressly disclose a light pipe located axially between facing ends of the PMT and the crystal and rails including shock absorbing material

Art Unit: 2884

extending along said crystal. However, light pipes are known to be an excellent guide for light from the scintillator to the PMT. References such as Frederick (US Pub. 20020030400 A1) teaches a light pipe 135 that optically couples the scintillation element 110 to the photomultiplier tube (PMT) 114 (Figure 16). Also, a reference such as Hefetz (US Patent 639391 B1) teaches a scintillator which includes a shaped light guide (pipe) to guide the light from scintillator to the sensor. (PMT) (Col. 4, Line 49++). Also, Frederick (US Patent 5962855) teaches springs (rails) 408 and an elastomeric pad and/or foam 410 providing support and cushioning for the scintillating element 14 (Col. 7, Line 18++).

Thus, it would have been obvious at the time the invention was made to a person of ordinary skill in the art to include in Frederick a light pipe in order to give excellent optical paths between the scintillator and the PMT such as that taught by Frederick and Hefetz. It also would have been obvious at the time the invention was made to a person of ordinary skill in the art to include in Frederick an elastomeric foam such as that taught by Frederick (US Patent 5,962,855) in order to give added protection to the scintillating crystal for absorbing shock and/or vibration.

Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Frederick *et al.* (US Pub 20020030400 A1).

With regards to claims 27 and 28, Frederick discloses a light pipe 135 serving to optically couple a scintillation crystal 110 to a photomultiplier. Frederick does not expressly disclose the PMT comprising a rectangular face for engaging a similarly shaped face scintillation crystal and a square face for engaging a similar shaped PMT. However, it would have been an obvious matter of design choice to have a light pipe with similarly-shaped faces and different surface areas for engagement with the PMT and scintillating crystal, since such a modification would have involved a mere change in the size of a component. A

Art Unit: 2884

change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Doeber et al. (US Patent 5,579,366) teaches a shock-absorbing bracket 34 (Figure 6). Sekela et al. (US Patent 6,222,192 B1) teaches a scintillation detector including a scintillation crystal coupled to a photomultiplier (PMT) with longitudinally loaded springs. Williams et al. (US Patent 6,872,937 B2) teaches a well logging apparatus including a detector assembly including an optical interface positioned between a scintillating crystal and a PMT.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Djura Malevic whose telephone number is 571.272.5975. The examiner can normally be reached on Monday - Friday between 8:30am and 4:00pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/780,850
Art Unit: 2884

Page 10

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